Biology Lab – Using the Microscope

A. Be able to identify the parts of the microscope and adjust the light.
Eyepiece, arm, base, stage, course adjustment, fine adjustment, scanning power objective, low power objective, high power objective, diaphragm, condenser

B. Be able to list the steps in focusing on a slide under scanning power, low power, and high power.

1. Select the scanning power objective
2. Place the slide on the stage with the object in the middle of the opening
3. Use the course adjustment to move the objective as close to the stage as possible.
4. While looking through the eyepiece, focus UP until the object comes into view
5. Center the object in the field of view
6. Switch to the low power objective; use the fine adjustment to focus
7. Switch to the high power objective; use the fine adjustment to focus

C. Be able to explain how to calculate the total magnification of each objective.
Total magnification = eyepiece magnification X objective lens magnification

D. Measure the field of view under scanning power using a metric ruler.

1. Focus on a metric ruler under scanning power. Measure the diameter of the scanning power field of view to the nearest 0.1 mm

E. **Calculate the field of view for the low and high power objective**.

$$\frac{\text{Scanning power magnification}}{\text{Low power magnification}} = \frac{\text{Low power field (mm)}}{\text{Scanning power field (mm)}}$$

$$\frac{\text{Low power magnification}}{\text{High power magnification}} = \frac{\text{High power field (mm)}}{\text{Low power field (mm)}}$$

F. State the relationship between magnification and field of view.
As the magnification increases, the field of view _____.

G. Use the field of view measurement to estimate the size of an object viewed under the microscope.

1. Focus on the object
2. Estimate the number of objects needed to cross the field of view side-by-side
3. Divide the field of view measurement by the number of objects

H. Complete the following chart:

Objective	Total magnification	Field of view (mm)	Field of view (um)
Scanning (4X)	4x10= 40		
Low power (10X)	10x10= 100		
High power (40X)	40x10= 400		

1 mm = 1,000um